

IN THE CLAIMS

Please amend the claims as indicated:

- 1 1. (currently amended) A rotatable downhole assembly adapted for conveying in a
2 borehole and determining a parameter of interest of a medium proximate to the
3 borehole, the downhole assembly comprising:
4 (a) a navigation assembly ~~for providing~~ which provides a measurement
5 indicative of toolface angle of the downhole assembly, said navigation
6 assembly associated with a first processor;
7 (b) a directional evaluation device ~~for providing~~ which provides
8 measurements indicative of the parameter of interest, said directional
9 evaluation device associated with a second processor; and
10 (c) a common bus operatively connected to the first processor and the second
11 processor.
12
- 1 2. (previously presented) The rotatable downhole assembly of claim 1 wherein navigation
2 assembly further provides an indication of a location of the downhole assembly.
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- 1 3. (original) The rotatable downhole assembly of claim 1 wherein said directional
2 evaluation device further comprises a formation evaluation device.
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- 1 4. (previously presented) The rotatable downhole assembly of claim 1 wherein said

2 navigation assembly is conveyed one of (A) a drillstring, (B) a coiled tubing, and,
3 (C) a wireline.

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1 5. (previously presented) The rotatable downhole assembly of claim 1 wherein said
2 navigation assembly is on a first housing and said directional evaluation device is
3 on a second housing, said first and second housing encircling a drive shaft, said
4 drive shaft having with a mud motor at a first end and a drilling device at a second
5 end.

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1 6. (original) The rotatable downhole assembly of claim 1 wherein said navigation
2 assembly comprises a gyroscope selected from (A) a two-axis gyroscope and, (B)
3 a three-axis gyroscope.

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1 7. (original) The rotatable downhole assembly of claim 1 wherein said navigation
2 assembly comprises a three-component magnetometer.

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1 8. (previously presented) The rotatable downhole assembly of claim 1 wherein:
2 (I) said first processor processes signals from said navigation assembly, while
3 the rotatable downhole assembly is being rotated, to provide a value of an
4 instantaneous tool face angle, said value being communicated on the
5 common bus at specified intervals, and;
6 (II) wherein said second processor processes signals from the directional

7 evaluation device, while the downhole assembly is being rotated, and
8 provides a signal indicative of the parameter of interest, said signal being
9 communicated on the common bus at specified intervals.

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1 9. (previously presented) The rotatable downhole assembly of claim 8 further comprising
2 at least one of (A) a telemetry device for transmitting information about the
3 parameter of interest to an uphole device, and, (B) a memory for storing values of
4 the instantaneous tool face angle and signal indicative of the parameter of
5 interest.

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1 10. (original) The rotatable downhole assembly of claim 8 wherein said processing of
2 signals from the first sensing device by the first processor is independent of said
3 processing of signals from the directional evaluation device by the second
4 processor.

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1 11. (original) The rotatable downhole assembly of claim 10 wherein said first and second
2 processors are spaced apart.

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1 12. (original) The rotatable downhole assembly of claim 10 wherein said first and second
2 processors are not spaced apart.

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1 13. (previously presented)The rotatable downhole assembly of claim 3 wherein said

2 directional evaluation device further comprises at least one of (I) at least one
3 gamma ray, (II) a resistivity device, (III) a density logging device.

1 14. (original) The rotatable downhole assembly of claim 13 wherein said at least one
2 gamma ray detector further comprises a pair of gamma ray detectors on opposite
3 sides of the rotatable downhole assembly.

1 15. (currently amended) The rotatable downhole assembly of claim 10 further comprising
2 a processor ~~for synchronizing~~ which synchronizes said value of the tool face angle
3 with the signal indicative of the parameter of interest.

1 16. (previously presented) The rotatable downhole assembly of claim 15 further
2 comprising at least one of (A) a telemetry device for transmitting information
3 about the parameter of interest to an uphole device, and, (B) a memory for storing
4 values of the instantaneous tool face angle and signal indicative of the parameter
5 of interest.

1 17. (currently amended) The rotatable downhole assembly of claim 15 wherein said
2 processor ~~for synchronizing~~ which synchronizes is one of the first processor and
3 the second processor.

1 18. (currently amended) A method of determining a parameter of interest of a medium

- 2 proximate to a borehole using a rotating assembly in said borehole, the method
3 comprising:
- 4 (a) obtaining information about a tool-face angle of the assembly during
5 rotation thereof;
- 6 (b) using a directionally sensitive evaluation device for obtaining
7 measurements indicative of the parameter of interest, said measurements
8 being obtained separately over a plurality of specified time intervals; and
- 9 (c) ~~using at least one processor for~~ determining from said obtained
10 information and said measurements of the directionally sensitive
11 evaluation device, partially processed measurements indicative of the
12 parameter of interest over a plurality of sectors of said tool face angle; and
- 13 (d) approximating said partially processed measurements by a series
14 expansion that includes a sinusoidal variation with said tool face angle.
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- 1 19. (original) The method of claim 18 wherein obtaining said information about said tool
2 face angle further comprises:
- 3 (i) using a navigation assembly including a first sensing device that is at least
4 one of (A) a gyroscope, (B) a magnetometer, and, (C) an accelerometer,
5 for providing a measurement indicative of said toolface angle; and
- 6 (ii) using a processor associated with the navigation assembly for determining
7 said toolface angle over said time intervals.
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1 20. (previously presented) The method of claim 19 wherein said rotating assembly
2 further comprises a drill bit for penetrating a formation, the method further
3 comprising using at least one of (I) said gyroscope, and, (II) an accelerometer, for
4 determining a rate of penetration (ROP) of said downhole assembly.
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1 21. canceled.
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1 22. (currently amended) The method of claim ~~24~~ 18 wherein said series expansion further
2 includes a sinusoidal variation of twice said tool face angle.
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1 23. (previously presented) The method of claim 18 wherein said directionally sensitive
2 evaluation device further comprises at least one nuclear sensor.
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1 24. (previously presented) The method of claim 23 wherein the at least one nuclear
2 sensor further comprises a pair of nuclear sensors on substantially opposite sides
3 of the downhole assembly.
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1 25. (previously presented)The method of claim 23 further comprising using a drill bit
2 coupled to the downhole assembly for penetrating a formation and using
3 measurements from said at least one nuclear sensor for determining a relative
4 inclination of the borehole to a formation boundary.
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1 26. (previously presented) The method of claim 24 further comprising using a drill bit
2 coupled to the downhole assembly for penetrating a formation and using
3 measurements from said pair of nuclear sensors for determining a relative
4 inclination of the borehole to a formation boundary.
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1 27. (previously presented) The method of claim 18 wherein said directionally sensitive
2 evaluation device comprises a resistivity device.
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1 28. (previously presented) The method of claim 18 wherein said directionally
2 sensitive evaluation device comprises a density measurement device.
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1 29. (original) The method of claim 21 further comprising using a processor for
2 determining from said series expansion an indication of proximity to a bed
3 boundary in the subsurface formation.
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1 30. (previously presented) A method of obtaining a processed image of a borehole in an
2 earth formation using a rotating downhole assembly in said borehole, the method
3 comprising:

4 (a) obtaining information about a tool-face angle of the assembly during
5 rotation thereof;

6 (b) using a directionally sensitive evaluation device for obtaining
7 measurements indicative of a property of said earth formation at a

- 8 plurality of tool-face angles;
- 9 (c) repeating (a) and (b) at a plurality of different times and obtaining a raw
- 10 data set;
- 11 (d) fitting said raw data set at each of said plurality of different times with a
- 12 fitting function to obtain a partially processed data set;
- 13 (e) applying a low pass filter to said partially processed data set at each of
- 14 said plurality of tool-face angles and defining a fully processed data set;
- 15 and
- 16 (f) displaying said fully processed data set as an image.

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- 1 31. (previously presented) The method of claim 30 wherein said fitting function further
- 2 comprises a sinusoidal function.

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- 1 32. (original) The method of claim 30 further comprising determining contours of an
- 2 equal value of said fully processed data set.

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- 1 33. (previously presented) The rotatable downhole assembly of claim 1 wherein said
- 2 navigation assembly includes at least one of (i) a gyroscope, (ii) a magnetometer,
- 3 and, (iii) an accelerometer

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- 1 34. (previously presented) The method of claim 23 wherein said at least one nuclear
- 2 sensor comprises a gamma ray sensor.